Chemical Profiling of light -emit ting porous Si and SiGe using transmission electron microscopy W. T. Pike, R.W. Fathauer, T. George and A. Ksendzov, Center for Space Microelectronics Technology, Jet Propulsion laboratory, California Institute of Technology, Pasadena, CA. - The source of light emission from porous Si is still the subject of intense speculation. Both quantum-size effects and the presence of photoluminescent chemical species have been claimed to be the source. of the photoemission. We report on the chemical profiling of porous Si and $Si_{1-x}Ge_x$ layers using electron energy-loss spectroscopy and x-ray microanalysis in a field emission scanning transmission electron microscope. The nanometer probe. available in such an instrument enables us to analyze the structure at a scale comparable to that required for quantum-sized crystallites The chemical in formation so obtained is compared to high resolution electron microscope images of the structure anti photolumi nescence spectra. Chemical profiling indicates that substantial amounts of carbon and oxygen are present in our light-emitting porous layers. in the. alloy layers, the. Si is found to be preferentially etched, leaving a Ge-rich surface layer. The mechanism of the etching process and the source for light emission in such structures tire discussed in the light of these. results. This work was sponsored by SDIO/IST and AFOSR.